

MT 123

Assembly exercise: spur and worm gear



The illustration shows the assembled gear and the GUNT Media Center, tablet not included

Description

- part of GUNT DigiSkills learning projects and the GUNT Practice Line for assembly, maintenance and repair
- supported by augmented reality
- multimedia instructional materials on USB flash drive and online in GUNT Media Center: 3D PDF, DXF files, STEP files, videos

The MT 123 unit deals with a twostage gear. The kit contains all the individual parts to build the gear. The gear comprises a spur gear stage as its input, with a downstream worm gear stage (combined gear).

The MT 123 kit is part of the GUNT Practice Line for assembly, maintenance and repair, which has been designed for technical colleges and company training centres. The assembly and disassembly processes can be completed easily within standard lesson times. Only basic tools are required for assembly, all of which are supplied with the kit. The fit seatings of the gear unit are designed to allow the complete assembly process to be performed by hand.

The contemporary multimedia instructional materials provide extensive technical information as base for lesson design. The core element of the teaching materials is a complete set of drawings as files with lists of parts, single-part drawings, exploded views, assembly drawings and 3D drawings. All drawings are to standard and are dimensioned in accordance with production requirements. The set of drawings consists of DXF files, STEP files and PDF files. Assembly videos are also useful features. The files are also available free of charge online in the GUNT Media Center. An augmented reality interface (Vuforia View) for mobile devices is available for visualising the processes and functions in a gear unit.

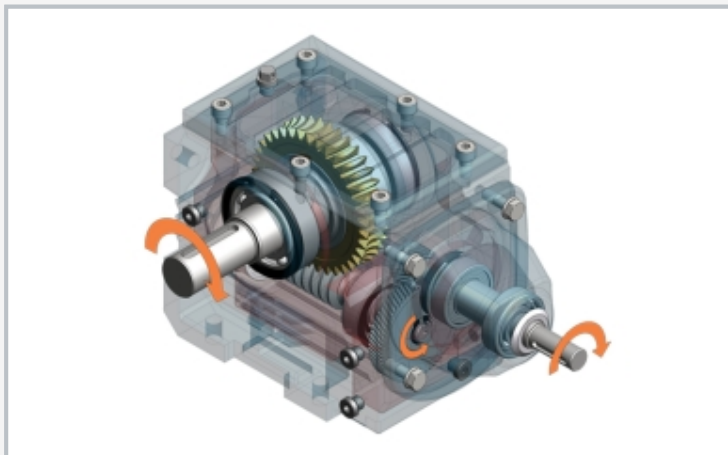
The disassembled spur and worm gear is delivered in a storage system with foam inlay. The transport roller MT 120.02 or the trolley MT 120.01 are suitable for convenient transport of the kit.

Learning objectives/experiments

- function and design of a spur and worm gear
- planning and presentation of the assembly process, supported by augmented reality
- assembly and disassembly, including for the purposes of maintenance and repair
- read and understand engineering drawings (PDF files, DXF files, STEP files)
- familiarisation with different file formats and their application, e.g. for 3D printing and CNC machining
- familiarisation with various machine elements: gear wheels, ball bearings
- familiarisation with assembly aids and jigs
- in conjunction with MT 173
 - ▶ functional testing of the assembled gear unit
- in conjunction with MT 174
 - ▶ preventive maintenance

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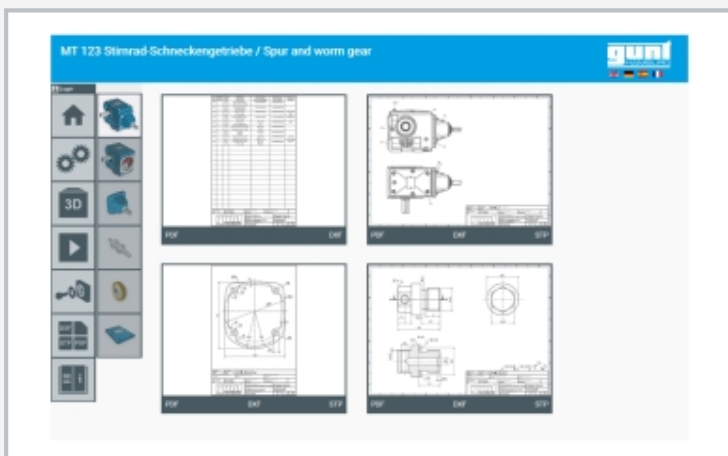
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Transparent sectional view of the assembled gear



Storage system with foam inlay: all components have their place, the foam is labeled



Screenshot of the GUNT Media Center

Specification

- [1] kit of a spur and worm gear
- [2] part of GUNT DigiSkills and of the GUNT Practice Line for assembly, maintenance and repair
- [3] complete, disassembled gear unit with set of small parts and 8 assembly jigs, housed in a storage system with foam inlay
- [4] gear unit comprising drive housing, worm pedestal housing, driving and driven shafts, spur gear stage and worm gear stage
- [5] spur gear stage with helical gear wheels
- [6] worm gear stage with cylindrical worm and globoid wheel
- [7] augmented reality: visualisation of machine elements, display of exploded views, functions
- [8] multimedia instructional materials: PDF, CAD files, STEP files, videos
- [9] online access to the GUNT Media Center

Technical data

Gear dimensions without shaft couplings

- LxWxH: 282x138x188mm

Transmission ratios

- spur gear stage: $i=2,83$
- worm gear stage: $i=12,33$
- total gear ratio: $i=34,94$

Spur gear stage

- pinion: number of teeth: $z=24$,
real pitch module: $m=1\text{mm}$
- gear wheel: $z=68$, $m=1\text{mm}$

Worm gear stage

- worm: $z=3$
- worm gear wheel: $z=37$, $m=2,7\text{mm}$

Max. output torque: 212Nm at 1400min^{-1}

Shaft connections

- drive: $\varnothing \times L$: $16 \times 40\text{mm}$
- driven: $\varnothing \times L$: $30 \times 60\text{mm}$

LxWxH: $600 \times 400 \times 930\text{mm}$ (storage system)

Weight: approx. 40kg

Required for operation

PC or online access recommended

Scope of delivery

- 1 kit
- 1 set of tools
- 1 set of assembly jigs
- 1 set of spare parts
- 5x storage system with foam inlay
- 1 set of instructional material, consisting of technical description of system, complete set of drawings with lists of parts (PDF, DXF, STEP), description of assembly and disassembly sequences, assembly videos, online access to the GUNT Media Center

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Optional accessories

MT 110.10	Cutaway model: spur and worm gear
MT 120.01	Trolley
MT 120.02	Transport roller
MT 173	Test stand for gears
MT 174	Sorting plant